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A/Method Of Packaging Goods

The present invention relates to a method of packaging goods, in particular packaging food-stuffs which remain fresh for a limited period only, such as breakfast cereals, crisps, biscuits and ground coffee.

Conventionally, food products such as breakfast cereals and the like are packaged in cartons which contain a sealed bag for holding a quantity of the breakfast cereal, usually in quantities of 125g to 1000g. Once the carton is opened and the factory seal of the bag is broken, the contents become stale and soft within a few weeks, or even sooner. Once stale the enjoyment of the crisp and fresh taste of the newly opened packet is lost. One solution to this is to supply individual 25g or 30g portion packs or any other suitable size of portion pack that may be desired. Portion packs comprise a bag containing an individual portion within an individual carton. This form of packaging is comparatively expensive compared with the larger cartons.

Furthermore, food products, in particular cereal flakes, at the bottom of the sealed bag tend to break or be crushed during filling of the bag and during transit, so that the last few portions of cereal in the bag become powder-like. This powder-like cereal is unattractive to consumers, so that consumers often discard the last few portions of cereal containing the powder-like cereal, thus resulting in wastage.

An object of the present invention is to overcome the above disadvantages.

The advantage of the present invention is that it provides a method of manufacturing packaging, which gives consumers the benefit of enjoying the fresh, crisp taste of a newly opened packet every time they consume the product. The invention also provides a method of manufacturing packaging which is relatively inexpensive yet provides the

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taste and freshness benefits of an individual portion pack. Furthermore, the invention provides a method of manufacturing packaging in which the contents of the packaging remain substantially unbroken until consumption.

The invention provides a method of packaging goods as claimed in Claim 1.

The strip of sealed pouches may be arranged substantially upright or transversely in the carton. Preferably, the strip of sealed pouches is arranged in a concertina or zigzag configuration in the carton.

In providing a strip of sealed pouches, a standard serving portion of a food product, for example breakfast cereal, of typically 25g or 30g, is provided and therefore the crisp and fresh taste of a newly opened packet can be enjoyed every time the cereal is consumed since breaking the seal of one pouch does not affect the integrity of the remaining pouches in the strip.

The packaged goods made according to the present invention provide a less expensive means of providing individual portions of a food product than that of the previously mentioned portion packs. Since the food product contained within a pouch remains fresh, there is little wastage of stale food products and the product has an extended shelf life. It also avoids the time difficulty in trying to carefully re-seal and close the carton in order to maintain integrity of the food product once the carton has been opened. It also provides a more hygienic method of serving food other than of sharing a large carton. Furthermore, it avoids the problem of attracting pests such as ants and mice to an open packet of food. Furthermore, providing individual portions of the food product makes it easier for calorie control and portion control for dieters. Packaging the food in individual pouches also reduces the risk of damage to particularly brittle food-stuffs, such as crisp cereal flakes, since the packaging and layer of air within each pouch and between each pouch has a cushioning effect, thus reducing the likelihood of breakage.

The method of packaging goods according to the present invention provides a relatively low cost of manufacture since the strip of pouches can easily be folded concertina-fashion into a typical existing carton which avoids the need to re-tool carton making machines. The method utilises established and proven materials. Further, the cartons can be varied in width, height and depth to provide different sizes giving a large shelf presence in retail outlets for promotional purposes etc. The method provides for different pack sizes to be produced on one machine, for example 8 pouches, 10, 16 or 20 pouch packets.

Furthermore, the method of packaging goods according to the present invention provides the option of combining different food products in a single carton.

Preferred embodiments of the present invention will now be described with reference to the accompanying drawings, wherein:

Figure 1 shows in a diagrammatic perspective view an initial step of forming a tube;

Figure 2 shows in a view similar to Figure 1 the steps of filling, sealing and perforating pouches formed in the tube;

Figure 3 shows in an enlarged perspective view the combined pouch perforating and severing tool of Figure 2;

Figure 4 shows a strip of pouches arranged in a zigzag manner across the width of the carton;

Figure 5 shows two strips of pouches arranged in a zigzag manner across the depth of the carton;

Figure 6 shows two strips of pouches arranged in a zigzag manner across the width of the carton;

**Figure 7 shows the strip of pouches of Figure 5 joined side by side;**

Figure 8 shows a strip of pouches arranged in a zigzag manner along the height of the carton:

Figure 9 shows two strips of pouches arranged in a zigzag manner along the height of the carton and

**Figure 10 shows two strips of pouches arranged substantially vertically in the carton.**

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In Figure 1 a sheet of plastics material 1 is wrapped around a cylindrical former 200 so that two longitudinal edges 201 of the plastics material overlap to form a tube 1<sup>1</sup>.

Although Figure 1 shows a tube of circular cross-section, the tube may have any other suitable cross-section such as a square or rectangular cross-section. The overlapping longitudinal edges 201 are then heat-sealed by means of a heated seam former 202 to form a central longitudinal seam 2. The base of the tube 1<sup>1</sup> is then sealed by means of heated sealing jaws 203 (See Figure 2). Two heated sealing jaws 203 move from opposite sides of the tube 1<sup>1</sup> towards the centre of the tube until they both contact the plastics material of the tube 1<sup>1</sup>. A seal 3, which is transverse to and overlaps the longitudinal seam 2, is thus formed. At the same time as the sealing jaws 203 are moving towards the centre of the tube, opposed pleat formers (not shown) move in a transverse direction to the sealing jaws 203 (in the direction of the arrows 4<sup>1</sup>), also towards the centre of the tube 1<sup>1</sup>. The pleat formers provide tucks in the side of the tube 1<sup>1</sup> so as to form diametrically-opposed pleats 4. The tube 1<sup>1</sup> is then filled with food-stuff 204 to be packaged. The food-stuff 204 is simply dropped into the tube 1<sup>1</sup> from above. As the food-stuff 204 is being dropped into the tube 1<sup>1</sup>, the tube 1<sup>1</sup> is moved downwards with respect to the sealing jaws 203 and when the desired quantity of the food-stuff 204 has been dropped into the tube 1<sup>1</sup>, the sealing jaws 203 and pleat formers move once again towards the centre of the tube 1<sup>1</sup> to simultaneously seal the tube 1<sup>1</sup> and form tucks at a pre-determined distance from the sealed base so as to form a "brick-shaped" pouch 5. This "brick-shaped" form is particularly space-efficient. The further seal 3 will commonly form the top seal of the pouch 5 and the base seal of a second pouch 5a. The volume of air in each pouch is determined by the pouch dimensions, which are calculated so as to be sufficient for the pouch to contain the desired quantity of food-stuff, as well as a quantity of air to protect the food-stuff. This is particularly important for delicate food-stuffs, such as cereal flakes.

The main bodies of the pouches 5 and 5a are substantially rectangular in cross-section. The pouches 5 and 5a are substantially the same size as one another. To allow separation of the pouches 5 and 5a at a later stage perforations 6 are made in the common seal 3. The perforations 6 are introduced into the common seal by means of a

comb-type cutter 205, which is located in one of the sealing jaws 203. The comb-type cutter 205 is illustrated in greater detail in Figure 3.

Once the sealing jaws 203 have formed the common seal 3, the comb-type cutter 205 moves from a retracted position in the sealing jaw 203 until it meets and pierces the common seal 3 at intervals across its width. The intervals between the perforations are determined by the spacing of teeth 206 of the comb-type cutter 205. The comb-type cutter 205 then retracts to its rest position until sealing next takes place. When a desired number of pouches has been filled and sealed to form a strip 7, for example 10 pouches, the step of forming perforations 6 in the common seal 3 is replaced by a cutting step. The comb-type cutter 205 will also be used in the cutting step. As before, the comb-type cutter will move from its retracted position in the sealing jaw 203, but instead of merely piercing the common seal 3, the comb-type cutter 205 pierces right through the common seal 3 until cutting edges 207 meet the common seal 3 and two adjacent pouches are completely severed from one another. The lower of the adjacent pouches is still attached to the strip 7 of filled and sealed pouches while the upper of the adjacent pouches forms a base for a further strip of pouches.

The dimensions of the seal 3 should be such that the "brick-shaped" air-filled cushioned pouches are sealed effectively and that the strip 7 of "brick-shaped" pouches may also be folded for storage in a space-efficient and cost-efficient manner.

The strip of filled and sealed pouches 7 is then inserted into a carton 8, as shown for example in Figure 4, where the strip of pouches is arranged in a concertina or zigzag manner across the width of the carton 8 in layers, each layer having two pouches. This arrangement of the pouches in the carton 8 serves to protect the food-stuff inside the pouches against crushing by food-stuff in adjacent pouches. Alternative arrangements of the pouches are shown in Figures 5 to 10. These arrangements also serve to protect the food-stuff in the pouches, in particular against crushing. In Figure 5, for example, two strips of pouches are arranged parallel to one another and in a zigzag manner across the depth (into the page) of the carton 8 in layers, each layer having only one pouch.

Figure 6 shows two strips of pouches arranged in a zigzag manner across the width of the carton 8 in layers, each layer having only one pouch.

Figure 7 shows a similar arrangement with a double strip 9 of pouches arranged in a zigzag manner across the depth of the carton 8. The double strip 9 of pouches is formed by dividing the tube 1<sup>1</sup> to form two sub-tubes (not shown) attached to one another by means of a series of central joining seams 10. The two sub-tubes are then sealed and filled in a similar manner to that described with reference to Figures 2 and 3. The central joining seams 10 are arranged parallel to and are attached to a surface 11 of each pouch. The two joined strips are separable from one another by way of perforations 12 in the central joining seams 10. The perforations 12 run substantially centrally along the length of the central joining seams 10.

Figure 8 shows a single strip of pouches arranged in a zigzag manner along the height of the carton 8 in layers, each layer having two pouches. Figure 9 shows a two strips of pouches arranged along the height of the carton 8 in layers, each layer of each strip having two pouches.

Figure 10 shows a further embodiment of the invention, in which the main bodies of the pouches 5 and 5a are substantially square in cross-section, and two separate strips of pouches are arranged parallel to one another and substantially vertically in the carton 8.

A single carton 8 might also contain several strips in which the size of the pouches in the respective strips is not the same. For example, a single carton might contain strips containing small pouches for children as well as strips of larger pouches for adults.

It will be appreciated that variations of the embodiments described above are also possible. For example, in the sealing step of the manufacturing process may use adhesive as a sealing means as an alternative to heat. The tube 1<sup>1</sup> might be formed of waxed paper, rather than plastics.

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Printed matter may be applied to each pouch prior to filling each pouch with the food-stuff, e.g. information relating to the food and calorie contents, the sell-by date etc.